

AGREEMENT  
BETWEEN  
THE UNITED STATES NUCLEAR REGULATORY COMMISSION (USNRC)  
AND  
THE RUSSIAN RESEARCH CENTER (RRC),  
FORMERLY THE I.V. KURCHATOV INSTITUTE FOR ATOMIC ENERGY (KI),  
ON FUEL BEHAVIOR AND MATERIAL SCIENCE RESEARCH

This Agreement is made between the United States Nuclear Regulatory Commission (hereinafter referred to as the USNRC) and the Russian Research Center, formerly the I.V. Kurchatov Institute for Atomic Energy (hereinafter referred to as RRC-KI), together hereinafter referred to as the "Parties":

Considering that the Parties:

- A. Have cooperated in the area of civilian nuclear reactor safety since December 16, 1993, under an Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning Operational Safety Enhancements, Risk Reduction Measures and Nuclear Safety Regulation for Civil Nuclear Facilities in the Russian Federation;
- B. Are currently cooperating in a five year cooperative agreement in the area of severe accident research, signed on August 14, 2000;
- C. Have a mutual interest in cooperation in the field of nuclear safety research, with the objective of improving the safety of reactors on an international basis;
- D. Have, as a mutual objective, reciprocity in the exchange of technical information in the area of reactor safety research;

The Parties have AGREED as follows:

**ARTICLE I – PROGRAM COOPERATION**

The Parties, in accordance with the provisions of this Agreement and subject to applicable laws and regulations in force in the respective countries, will join together in nuclear safety programs related to the behavior of reactor fuel, especially the behavior of reactor fuel with high burnup. Additional work related to fuel behavior research, 3-D reactor physics, or material science research may be added during the course of this Agreement.

## ARTICLE II – FORMS OF COOPERATION

Cooperation between the Parties may take the following forms:

- A. The exchange of information in the form of experimental results, technical reports, code validation data, correspondence, newsletters, visits, joint meetings, and such other means as the Parties agree.
- B. The temporary assignment of personnel of one Party or of its contractors to laboratories or facilities owned by the other Party; each assignment to be considered on a case-by-case basis and to be the subject of a separate attachment-of-staff agreement between the Parties.
- C. The execution of joint programs and projects, including those involving a division of activities between the Parties. Each joint program and project shall be considered on a case-by-case basis and may be the subject of a separate agreement or arrangement, if determined to be necessary by either of the Parties to this Agreement or their research organizations. Otherwise, it will be accomplished by an exchange of letters between the research organizations of the Parties, subject at least to the terms and conditions of this present Agreement.
- D. The use by one Party of facilities that are owned by the other Party or in which research is being sponsored by the other Party; such use of facilities may be the subject of separate arrangements and may be subject to commercial terms and conditions.
- E. If either Party wishes to visit, assign personnel, or use the facilities owned or operated by entities other than the Parties to this Agreement, the Parties recognize that the approval of such entities will in general be required with respect to the terms upon which such visit, assignment, or use will be made.
- F. Any other form agreed between the Parties.

## ARTICLE III – SCOPE OF COOPERATION

The objectives of this Agreement are to (1) obtain experimental data on the behavior of Zr-1%Nb fuel rod cladding under postulated accident conditions, (2) advance the development of fuel rod codes that are used to analyze fuel behavior under accident conditions, and (3) explore and modify plant transient codes for analyzing postulated accidents in light-water reactors containing high-burnup fuel.

### A. USNRC Scope of Responsibility

Subject to the availability of appropriated funds, and within the above guidelines and Article VI, the USNRC will provide and coordinate the provision of the following specified goods and services related to the study of fuel behavior.

## 1. Codes

- a. The USNRC will transmit to the RRC-KI the following fuel behavior computer codes and associated documentation developed by the USNRC: FRAPCON-3, FRAP-T6, FRAPTRAN, MATPRO. These computer codes will include the latest versions for personal computer (PC) and workstation applications.
- b. The USNRC will also accommodate reasonable requests from RRC-KI regarding installation and use of these codes on PCs and workstations.
- c. The USNRC will provide input data for U.S. plant designs and other parameters that may become part of analytical activities that are undertaken.

## 2. Meetings, Visits, and Exchange of Personnel

Subject to Article V.K of this Agreement, the USNRC will:

- a. Permit Russian personnel sponsored by RRC-KI to attend, as appropriate, technical program review meetings and technical progress meetings related to this Agreement.
  - b. Facilitate visits of RRC-KI sponsored personnel to laboratories at which USNRC-sponsored work related to this Agreement is being conducted.
  - c. Permit the assignment of RRC-KI sponsored personnel to participate in USNRC nuclear safety programs related to this Agreement and to have ready access to relevant documentation associated with severe accident codes and concrete containment performance.
3. The USNRC will direct and coordinate with the RRC-KI the above activities to assure timely and effective completion of the above tasks.
  4. During the course of this cooperation, the USNRC and RRC-KI will develop specific tasks such as those listed herein. These tasks, once developed, will be included as technical Addenda to this Agreement.

## B. RRC-KI Scope of Responsibility

### 1. Experimental Investigations

Perform experimental tests and measurements on irradiated and unirradiated fuel rod cladding in laboratories, hot cells, and test reactors. These investigations are to be performed on Russian cladding alloys that are similar to alloys being used in the U.S. and are therefore of mutual interest.

In 2002, the RRC-KI shall (1) continue the measurements of mechanical properties of Zr-1%Nb cladding under LOCA conditions and summarize all results of this work in a NUREG/IA report, (2) assess the accuracy of the FRAPTRAN code for Zr-1%Nb cladding analysis on the basis of different types of verification calculations, and (3)

prepare a NUREG/IA report with results of all the analytical work carried out during calendar year 2001-2002.

## 2. Code Development and Applications

Modify USNRC fuel rod computer codes, which have been developed for Zircaloy cladding, such that they are applicable to Russian cladding alloys. Provide models, materials properties, and correlations in forms that are compatible with USNRC codes and materials properties libraries. Perform studies with Russian plant transient codes in comparison with U.S. plant transient codes for the purpose of validation and further development.

In 2002, the RRC-KI shall (1) complete a sensitivity study for the Three Mile Island -1 boron dilution accident with emphasis on spatial effects in moderator flow modeling, (2) complete validation of the BARS code for mixed oxide (MOX) fuel using additional data (VENUS-2 and others), (3) perform PARCS-BARS intercomparisons on MOX-fuel systems, and (4) in collaboration with Brookhaven National Laboratory, initiate work on input development and safety analysis of a light water reactor MOX core.

## 3. Additional Work

Subject to availability of funds and agreement between USNRC and RRC-KI, additional work related to fuel behavior research, 3-D reactor physics, or material science research may be added under this Agreement, subject to USNRC receipt and approval of a work plan developed by RRC-KI.

## 4. Quarterly Technical and Financial Progress Reports

The RRC-KI will prepare a quarterly summary letter report on each of the above tasks. Each report should include the title of the project, a Financial Identification Number (FIN) to be provided by the USNRC, the period of performance, and the reporting period. This report should contain two sections as indicated below.

### 4.1 Project Status Section

This section should include:

- a. A listing of the activities completed during the period and milestones reached or, if missed, an explanation why.
- b. Any problems or delays encountered or anticipated and recommendations for resolution.
- c. A summary of progress to date (this may be expressed in terms of percentage completion for the project).
- d. Planned accomplishments for the next reporting period.

- e. Preliminary or interim results, conclusions, trends, or other items of information that the RRC believes are of timely interest to the USNRC.
- f. Problems or delays experienced by the RRC-KI in the conduct of this effort and the proposed resolutions.

#### 4.2 Financial Status Section

This section should provide the total amount of dollars expended (cost) during the reporting period for each task, identifying the major items of expense and the total cumulative expenditure for the year to date.

#### 5. Audit and Record Requirements

The RRC-KI shall maintain complete accounting records of all funds provided to it by the USNRC under this Agreement in accordance with accounting principles generally accepted in the Russian Federation. These accounting records shall be maintained for a period of no less than 3 years after the expiration of this Agreement. The USNRC, or other authorized U.S. Government officials, shall have full access to the accounting records for the purposes of financial audit during the period of this Agreement and after its expiration for a period of no less than 3 years.

#### 6. Meetings, Visits and Exchange of Personnel

In accordance with Article V.K of this Agreement, the RRC-KI will:

- a. Permit USNRC personnel or contractors sponsored by USNRC to attend, as appropriate, technical program review meetings and technical progress meetings concerning RRC-KI work related to this Agreement.
- b. Facilitate visits of USNRC personnel or contractors sponsored by USNRC to laboratories at which RRC-KI sponsored work related to this Agreement is being conducted.
- c. Permit the assignment of USNRC personnel or contractors sponsored by USNRC to participate in the RRC-KI nuclear safety program related to this Agreement and to have ready access to relevant nuclear reactor safety documentation, codes and results.
- d. Attend USNRC's annual Nuclear Safety Research Conference to present results of research work as requested. In general, this will involve two trips annually to the U.S.

### ARTICLE IV – FINANCIAL CONSIDERATIONS

The obligations of the Parties are subject to the appropriation of funds by the appropriate governmental authorities and to laws and regulations applicable to the parties. Subject to the availability of funds, the USNRC will provide the RRC-KI the sum of \$150,000.00 in calendar year 2002. The first payment of \$75,000.00 will be made upon approval of a work plan called a

"Description of Work." RRC-KI will complete a Description of Work acceptable to both Parties within 60 days after this Agreement is signed. A second payment of \$75,000.00 will be made in December 2002. Payment will be made upon receipt of RRC-KI invoices, subject to U.S. Government rules and regulations.

If other technical addenda are developed during the course of this cooperation, the resulting financial considerations will be included in those addenda.

#### ARTICLE V -- ADMINISTRATION OF THE AGREEMENT

- A. The Parties will each designate one representative to coordinate and determine the detailed implementation of this Agreement. These representatives may, at their discretion, delegate this responsibility to the appropriate technical staff within their agencies with respect to a given issue. Each single designated representative will be referred to as an Administrator of this Agreement.
- B. This Agreement states restrictions concerning dissemination of proprietary or other confidential or privileged information. Other information that may be restricted includes matters related to organization, budget, personnel, or management.
- C. Each Party to this Agreement will have access to all nonproprietary reports written by the other Party's technical personnel assigned to the respective activities that derive from its participation in this Agreement.
- D. Subject to Article V.G. and V.H., USNRC-supplied codes and analytical techniques and any improvements, modifications or updates to such codes or techniques will not be disseminated to other parties outside the Russian Federation without the consent of the USNRC.
- E. Except for dissemination to USNRC and its principal contractors in accordance with this Agreement, RRC-KI supplied codes and analytical techniques and any improvements, modifications or updates to such codes and techniques will not be disseminated to other parties outside the U.S. without the consent of the RRC-KI.
- F. The application or use of any codes exchanged or transferred between the Parties under this Agreement shall be the responsibility of the receiving Party, and the transmitting Party does not warrant the suitability of such codes for any particular use or application.
- G. The USNRC computer codes disseminated under this Agreement are to be considered privileged information unless otherwise noted, are protected as such by the USNRC, and shall be treated likewise by RRC-KI. They are, in particular, subject to all the provisions of Article VI, including the requirements for an agreement of confidentiality prior to dissemination, with the exception that they need not be marked with the restrictive designation. The codes are subject to this protection in both object and source forms and as recorded in any media.
- H. The USNRC computer codes and other related analytical techniques that are provided to the RRC-KI under this Agreement and any improvements, modifications or updates to such

codes or techniques are for the purpose of this Agreement and shall not be used by RRC-KI or other parties within the Russian Federation for commercial purposes; that is, for financial or other benefits not concerned with the study of reactor safety.

Among the code uses that will be permitted under this Agreement are those related to research in the reactor safety area and analyses performed by the Parties or their contractors that can assist regulators and plant personnel in assessing the safety of the plant, analyzing operating events, and training operators. Specific examples of permitted analyses include: design basis accidents (e.g., loss-of-coolant accidents), anticipated transients, accident management and emergency operating procedures, mid-loop operation, analysis to support PRA success criteria, power upgrades and reload.

Prohibited uses of the code include: (1) analyses to develop a new reactor design, and (2) analyses to support power upgrades and reload in the U.S., unless performed by a U.S. subsidiary.

- I. The USNRC codes and other related analytical techniques shall not be advertised directly or by implication to obtain contracts related to the construction, servicing, or refueling of nuclear facilities, nor shall advertising imply that the USNRC has endorsed any particular analyses or techniques.
- J. It is understood that the USNRC makes no warranties whatsoever for the ability or suitability of any USNRC code or other analytical technique to perform in any particular manner for any particular purpose, or to accomplish any particular task. It is further understood that the USNRC accepts no liability for damages of any type that may result from the use of the USNRC codes or other analytical techniques provided under this Agreement.
- K. Travel costs, living expenses, and salaries will be borne by the Parties who incurred them unless specified otherwise.
- L. All reports published within the scope of this Agreement and all meetings held will be in English.

## ARTICLE VI – EXCHANGE AND USE OF INFORMATION AND INTELLECTUAL PROPERTY

### A. General

The Parties support the widest possible dissemination of information provided or exchanged under this Agreement, subject both to the need to protect proprietary or other confidential or privileged information as may be exchanged hereunder, and to the provisions of the Intellectual Property Addendum, which is an integral part of this Agreement.

### B. Definitions (As used in this Agreement)

1. The term "information" means nuclear energy-related regulatory, safety, safeguards, waste management, scientific, or technical data, including information on results or methods of assessment, research, and any other knowledge intended to be provided or exchanged under this Agreement.

2. The term "proprietary information" means information made available under this Agreement which contains trade secrets or other privileged or confidential commercial information (such that the person having the information may derive an economic benefit from it or may have a competitive advantage over those who do not have it), and may only include information which:
  - a. has been held in confidence by its owner;
  - b. is of a type which is customarily held in confidence by its owner;
  - c. has not been transmitted by the owner to other entities (including the receiving Party) except on the basis that it be held in confidence;
  - d. is not otherwise available to the receiving Party from another source without restriction on its further dissemination; and
  - e. is not already in the possession of the receiving Party.
3. The term "other confidential or privileged information" means information, other than "proprietary information," which is protected from public disclosure under the laws and regulations of the country of the Party providing the information and which has been transmitted and received in confidence.

C. Marking Procedures for Documentary Proprietary Information

A Party receiving documentary proprietary information pursuant to this Agreement will respect the privileged nature thereof, provided such proprietary information is clearly marked with the following (or substantially similar) restrictive legend:

"This document contains proprietary information furnished in confidence under an Agreement dated \_\_\_\_\_ between the United States Nuclear Regulatory Commission and the Russian Research Center and shall not be disseminated outside these organizations, their consultants, contractors, and licensees, and concerned departments and agencies of the Government of the United States and the Government of the Russian Federation without the prior approval of (name of transmitting Party). This notice shall be marked on any reproduction hereof, in whole or in part. These limitations shall automatically terminate when this information is disclosed by the owner without restriction."

This restrictive legend shall be respected by the receiving Party and proprietary information bearing this legend shall not be used for commercial purposes, made public, or disseminated in any manner unspecified by or contrary to the terms of this Agreement without the consent of the transmitting Party.

D. Dissemination of Documentary Proprietary Information

1. In general, proprietary information received under this Agreement may be freely disseminated by the receiving Party without prior consent to persons within or employed

by the receiving Party, and to concerned Government departments and Government agencies in the country of the receiving Party.

2. In addition, proprietary information may be disseminated without prior consent:
  - a. to prime or subcontractors or consultants of the receiving Party located within the geographical limits of that Party's nation, for use only within the scope of work of their contracts with the receiving Party in work relating to the subject matter of the proprietary information;
  - b. to domestic organizations permitted or licensed by the receiving Party to construct or operate nuclear production or utilization facilities, or to use nuclear materials and radiation sources, provided that such proprietary information is used only within the terms of the permit or license; and
  - c. to domestic contractors of organizations identified in D.2.b., above, for use only in work within the scope of the permit or license granted to such organizations;

Provided that any such dissemination of proprietary information under D.2.a., b., and c., above, will be on an as-needed case-by-case basis, will be pursuant to an agreement of confidentiality, and will be marked with a restrictive legend substantially similar to that appearing in Article VI. C. above.

3. With the prior written consent of the Party furnishing proprietary information under this Agreement, the receiving Party may disseminate such proprietary information more widely than otherwise permitted in subsections 1. and 2. The Parties shall cooperate in developing procedures for requesting and obtaining approval for such wider dissemination, and each Party will grant such approval to the extent permitted by its national policies, regulations, and laws.

E. Marking Procedures for Other Confidential or Privileged Information of a Documentary Nature

A Party receiving under this Agreement other confidential or privileged information shall respect its confidential nature, provided such information is clearly marked so as to indicate its confidential or privileged nature and is accompanied by a statement indicating

1. that the information is protected from public disclosure by the Government of the transmitting Party; and
2. that the information is transmitted under the condition that it be maintained in confidence.

F. Dissemination of Other Confidential or Privileged Information of a Documentary Nature

Other confidential or privileged information may be disseminated in the same manner as that set forth in paragraph D., Dissemination of Documentary Proprietary Information.

G. Non-Documentary Proprietary or Other Confidential or Privileged Information

Non-documentary proprietary or other confidential or privileged information provided in seminars and other meetings arranged under this Agreement, or information arising from the attachments of staff, use of facilities, or joint projects, shall be treated by the Parties according to the principles specified for documentary information in this Agreement, provided, however, that the Party communicating such proprietary or other confidential or privileged information has placed the recipient on notice as to the character of the information communicated.

H. Consultation

If, for any reason, one of the Parties becomes aware that it will be, or may reasonably be expected to become, unable to meet the nondissemination provisions of this Agreement, it shall immediately inform the other Party. The Parties shall thereafter consult to define an appropriate course of action.

I. Other

Nothing contained in this Agreement shall preclude a Party from using or disseminating information received without restriction by a Party from sources outside of this Agreement.

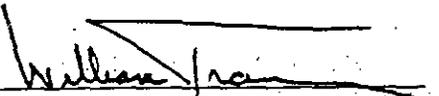
ARTICLE VII – FINAL PROVISIONS

- A. This Agreement shall enter into force on signature by the Parties and shall be effective for a period of five (5) years. It may be extended for a further period of time by written agreement of the Parties.
- B. Either Party may withdraw from the present Agreement after providing the other Party written notice at least 180 days prior to its intended date of withdrawal.
- C. All costs arising from implementation of this Agreement will be borne by the Party that incurs them except when specifically agreed to otherwise by both Parties.
- D. The Parties to this Agreement reserve the right to modify or extend the activities described in Article III within the intended scope of this Agreement upon written concurrence of its Administrators.

E. Any dispute between the parties concerning the interpretation or application of this Agreement will be settled by mutual agreement of the Parties.

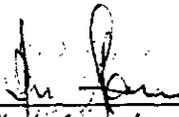
DONE at Rockville, MD on August 9, 2002, and at Moscow Russia on August 14, 2002.

FOR THE UNITED STATES NUCLEAR  
REGULATORY COMMISSION:

By   
William D. Travers

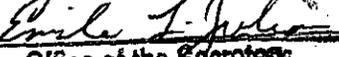
Title: Executive Director  
for Operations

FOR THE RUSSIAN RESEARCH  
CENTER:

By:   
Vladimir Asmolov

Title: Director

CERTIFIED A TRUE COPY

BY   
Office of the Secretary

## INTELLECTUAL PROPERTY ADDENDUM

Pursuant to Article VI of this Agreement:

The Parties shall ensure adequate and effective protection of intellectual property created or furnished under this Agreement and relevant technical addenda. The Parties agree to notify one another in a timely fashion of any inventions or copyrighted works arising under this Agreement and to seek protection for such intellectual property in a timely fashion. Rights to such intellectual property shall be allocated as provided in this Addendum.

### I. SCOPE

- A. This Addendum is applicable to all cooperative activities undertaken pursuant to this Agreement, except as otherwise specifically agreed by the Parties or their designees.
- B. For purposes of this Agreement, "intellectual property" shall have the meaning found in Article 2 of the Convention Establishing the World Intellectual Property Organization, done at Stockholm, July 14, 1967; viz., "intellectual property" shall include the rights relating to:
- literary, artistic and scientific works,
  - performances of artists, phonograms, and broadcasts,
  - inventions in all fields of human endeavor,
  - scientific discoveries,
  - industrial designs,
  - trademarks, service marks, and commercial names and designations,
  - protection against unfair competition,
- and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields."
- C. This Addendum addresses the allocation of rights, interests, and royalties between the Parties. Each Party shall ensure that the other Party can obtain rights to intellectual property allocated in accordance with the Addendum by obtaining those rights from its own participants through contracts or other legal means, if necessary. This Addendum does not otherwise alter or prejudice the allocation between a Party and its nationals, which shall be determined by that Party's laws and practices.
- D. Disputes concerning intellectual property arising under this Agreement should be resolved through discussions between the concerned participating institutions or, if necessary, the parties or their designees. Upon mutual agreement of the parties, a dispute shall be submitted to an arbitral tribunal for binding arbitration in accordance with the applicable rules of international law. Unless the Parties or their designees agree otherwise in writing, the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL) shall govern.

- E. Termination or expiration of this Agreement shall not affect rights or obligations under this Addendum.

## II. ALLOCATION OF RIGHTS

- A. Each Party shall be entitled to a non-exclusive, irrevocable, royalty-free license in all countries to translate, reproduce, and publicly distribute scientific and technical journal articles, reports, and books directly arising from cooperation under this Agreement. All publicly distributed copies of copyrighted work prepared under this provision shall indicate the names of the authors of the work, unless an author explicitly declines to be named.
- B. Rights to all forms of intellectual property, other than those rights described in Section II(A) above, shall be allocated as follows:
1. Visiting researchers, for example, scientists visiting primarily in furtherance of their education, shall receive intellectual property rights under the policies of the host institution. In addition, each visiting researcher named as an inventor shall be entitled to national treatment with regard to awards, bonuses, benefits, or any other rewards, in accordance with the policies of the host institution.
  2. (a) For intellectual property created during joint research, for example, when the Parties, participating institutions, or participating personnel have agreed in advance on the scope of work, each Party shall be entitled to obtain all rights and interests in its own country. The Party in whose country the invention was made shall have first option to acquire all rights and interests in third countries. If research is not designated as "joint research," rights to intellectual property arising from the research will be allocated in accordance with paragraph II.B.1. In addition, each person named as an inventor shall be entitled to national treatment with regard to awards, bonuses, benefits, or any other rewards, in accordance with the policies of the host institution.  
  
(b) Notwithstanding paragraph II.B.2.(a), if a type of intellectual property is available under the laws of one Party but not the other Party, the Party whose laws provide for this type of protection shall be entitled to all rights and interests worldwide. Persons named as inventors of the property shall nonetheless be entitled to royalties as provided in paragraph II.B.2.(a).